

-1-

- TITLE: Winter Wheat
- PROJECT: Small Grains Investigations MS 756
- YEAR: 1971
- PERSONNEL: Leader - Vern R. Stewart
Cooperator - G. A. Taylor
- LOCATION: Northwestern Agricultural Research Center and several off station locations throughout western Montana which will be identified in the manuscript.
- DURATION: Indefinite
- OBJECTIVES:
1. To obtain the information necessary for making varietal recommendations and evaluating new varieties and selections.
 2. To cooperate in a breeding program in Northwest Montana designed to produce high yielding varieties with particular emphasis on the acceptable quality and resistance for dwarf bunt and stripe rust. Other agronomic characteristics such as straw strength, winter hardiness etc., will be evaluated in this program.
- SIGNIFICANT FINDINGS:
1. Semi-dwarf lines used provide good straw strength, but are not satisfactory for dwarf smut resistance.
 2. Lines with PI 178383 parentage provide good dwarf smut resistance.
 3. Cheyenne or Cheyenne types are best suited for Ravalli County wheat growing area.
- FUTURE PLANS: Plans for 1971-72 include regular yield nurseries and assistance in the overall state breeding program.

MATERIALS AND METHODS:

Standard nursery procedures were used in all of the variety testing programs. A randomized block design was used having four to six replications. Data obtained were: yield; plant height; test weight; disease and lodging. Nurseries grown were: Intrastate Winter Wheat Nursery at the Northwestern Agricultural Research Center in Field E-3; Western Regional Hard Red Winter Wheat Nursery grown on the L. B. Claridge farm, Northwest of Kalispell in a dwarf bunt area; Uniform White Wheat Nursery grown at the Northwestern Agricultural Research Center in Field E-3. The off station nurseries were planted in Ravalli, Missoula, Lake, Sanders and Mineral Counties.

Plots were harvested with a power harvester.

RESULTS AND DISCUSSIONS:Intrastate Hard Red Winter Wheat Nursery

Four semi-dwarf lines were significantly higher in yield than Crest the check variety, and had exceedingly good straw strength. In all four varieties there was a high incidence of dwarf smut. Table 1. The mean of the nursery 52.3 bu/a is about average for the area in which it was grown. Lodging was very severe throughout the nursery except for the semi-dwarf lines already discussed.

In this area only short strawed or very strong strawed varieties should be considered for future testing.

Nine varieties are included in the ten year summary as seen in Table 2. Cheyenne is used as the long term check and is the only variety grown for the last consecutive ten years. Wanser, McCall and Crest are the only varieties that are equal to or exceed Cheyenne in yield. Only Crest is resistant to the prevalent race of dwarf smut.

Western Regional Hard Red Winter Nursery

The C.V. is rather high in this nursery because of unevenness in stands in replication number three. The dwarf smut level was not high, but of a high enough level to secure good differential reading. McCall and Wanser, both high yielding varieties, are very susceptible to dwarf smut. A trace amount of dwarf smut was noted in the variety Crest this season.

There were no yields significantly higher than Crest (the check) in this nursery, however twelve entries were found to be significantly lower. The mean of 36.6 bu/a is about average for this area of the valley.

Uniform White Wheat Nursery

Dwarf smut levels in this nursery were sufficient to make good differential reading between entries. Those lines with P.I. 178383 in their parentage had a high level of resistance. Luke and Nugaines were about equal in yield. Straw strength in Luke is some less than Nugaines. There were no other entries in the nursery that would be of potential value in this area, because of their susceptibility to dwarf smut. Luke is about four days later in heading than Nugaines and two to three inches taller. See Table 4 for complete details.

Seven varieties have been tested for nine years in this nursery (Table 5). Some of these will be dropped in the 1972 growing season as long time checks. Based on two years data at this location plus additional data from Washington and Oregon, Luke is to be added to the recommended list for 1972. A seed increase is being grown this season.

Off Station Nurseries

These nurseries were composed of 16 entries.

A severe infestation of blue mustard in the nursery located on the Jack Marrian farm in Sanders County, made harvest impossible and the nursery was abandoned. Very poor wheat stands in Mineral County was the reason for dropping this nursery. This study was located on the Elmer Hankenson farm near Tarkio, Montana.

Table 4. Agronomic data from the Western Regional White Winter Wheat nursery grown on the Northwestern Agricultural Research Center, Kalispell, Montana in 1971. Experimental Design - random block, four replications.

Planting date: September 21, 1970 Harvest date: August 17, 1971 Size of plot: 16 sq. ft.

C.I. or State #	Variety	Yield Bu/A	Test Wt. Lbs/Bu.	Heading ^{1/} Date	Plant Height	Lodging		Dwarf Smut	Stripe Rust	
						Prev %	Sev 0-9		Sev. %	Type 0-9
14564	Nord Desprez/2*Sel.101	113.06	59.5	163	35.5	24.8	.3	2.5	.0	.0
14565	Nord Desprez/2*Sel. 101	111.91	59.5	161a	37.8	99.0a	1.0	2.5	.3	.5
WA 5828	PI 178383*2//Omar/1834	106.89	60.5	162a	35.3	.0	.0	6.5	1.8	2.5
WA 5829	S.Helvia//Suwon 92/3645	104.48	60.0	163	36.5	49.5a	.5	7.5	.3	1.0
14586	Luke	103.11	59.5	168a	39.5a	89.3a	2.8a	.3	.0	.0
13968	Nugaines ^{2/}	102.83	61.0	164	36.3	.0	.0	5.0	2.8	1.5
14485	Suwon 92/4*Omar	101.21	60.5	165	43.0	57.0	3.5a	7.5	.0	.0
14483	Suwon 92/4*Burt	100.43	61.5	160a	35.8	.0	.0	4.0	.3	.3
ID 5013	Gaines*2/Swedish Type	99.53	58.5	165	37.3	.0	.0	1.8	.0	.0
WA 5827	C 59287//(Omar/1834-3)	98.98	57.0	168a	37.8	64.8a	4.3a	.0	.0	.0
WA 5826	Om/1834-3//178383/13431	98.46	57.9	170a	39.0a	1.3	.8	.0a	.0	.0
14563	Yamhill	97.86	59.4	169a	44.5a	74.3a	.8	11.3a	.0	.0
OR 6739	178383/2*Omar//13438	97.61	60.5	161a	39.8a	49.5a	.8	3.8	.0	.0
OR 6857	27-15//Rio/Rex/3/Eg/4/Mo	93.33	61.5	168	45.3a	86.8a	2.3a	.0a	.0	.0
12385	Brevor	80.93	61.0	164	47.8a	86.8a	6.5a	2.5	30.0	2.3
12696	Burt	80.28	62.0	161a	47.0a	99.0a	1.8	10.0a	10.0	2.3
OR 6882	Oam/3/178383/2*Omar//101	74.30	60.0	167	51.0a	81.8a	8.0a	.0a	.0	.0
11755	Elgin	72.95	61.0	168a	49.5a	84.3a	7.5a	11.3a	57.5a	9.0a
13072	Omar	72.22	59.5	168a	50.0a	99.0a	8.5a	2.8	32.5a	6.5a
13740	Moro	68.32	57.0	168a	47.8a	99.0a	9.0a	.0a	.0	.0
WA 5572	Omar Mutant 642026-197	62.97	60.0	167	45.8a	99.0a	7.3a	.3a	1.5	.8
1442	Kharkof	62.10	60.5	162	51.5a	99.0a	8.3a	12.5a	.0	.0
10063	Golden	61.85	57.5	167	50.5a	99.0a	8.8a	3.8	31.3a	9.0a
5408	Triplet	59.79	61.0	161a	49.3a	99.0a	8.3a	12.5a	18.5a	9.0a
WA 5353	Omar Mutant	59.67	60.5	168a	47.5a	47.5a	6.3a	6.3a	1.3	1.5

^{1/} Days from January 1 ^{2/} Check variety ^{a/} Values significantly different than the check (.05)
 * Varieties yielding significantly less than the check (.05)

\bar{x}	87.4	59.5	169.9	43.2	63.6	3.9	4.6	7.5	1.8
F-Value for variety comparison	20.60*	0.0	11.11*	46.19*	8.51*	18.41*	6.49*	6.91*	18.63*
S.E. \bar{x}	4.00	0.0	.92	.85	13.07	.82	1.67	5.64	.71
L.S.D. (.05)	11.28	0.0	2.60	2.40	36.86	2.30	4.72	15.92	1.99
C.V. %	4.58	0.0	.56	1.97	20.56	21.10	36.61	75.15	38.41

-7-

Table 5 . Summary of uniform white winter wheat nursery grown at the Northwestern Agricultural Research Center, Kalispell, Montana from 1962 - 1971.

C.I. or State #	Variety	1962	1963	1964	1966	1967	1968	1969	1970	1971	Sta. Yrs.	\bar{x}	% Omar
13072	Omar	60.2	36.0	51.2	58.7	51.4	73.9	71.0	75.0	72.2	9	61.1	100
12385	Brevor	68.5	61.7	67.7	71.0	60.0	87.9	68.4	75.8	80.9	9	71.3	117
10063	Golden	50.6	43.5	42.3	55.0	46.3	70.4	67.2	64.2	61.9	9	55.7	91
12696	Burt	60.0	58.7	54.6	62.2	46.0	86.5	66.0	71.6	80.3	9	65.1	107
1442	Kharkof	48.8	50.1	49.2	52.1	47.4	58.5	58.9	56.4	62.1	9	53.7	87
5408	Triplet	50.2	49.8	51.1	59.5	47.4	71.3	57.2	63.6	59.8	9	56.6	93
11755	Elgin	59.3	41.6	57.3	52.3	49.6	80.5	51.2	74.1	73.0	9	59.9	98
13740	Moro			50.1	85.9	57.2	86.3	65.7	75.4	68.3	7	69.8	108
13968	Nugaines				79.7	58.7	85.8	63.2	77.6	102.8	6	78.0	116
14485	Suwon92/4*Omar (Paha)						98.1	65.4	87.0	101.2	4	87.9	120
14564	Nord Desprez/2*Sel. 101						90.1	62.7	87.3	113.1	4	88.3	121
14483	Suwon 92/4*Burt						84.5	55.4	73.1	100.4	4	78.4	107
14563	Heines VII/Redmond(Yamhill)							69.6	78.4	97.9	3	82.0	112
OR 6739	178383/2*Omar//13438							63.3	80.7	97.6	3	80.5	111
14586	(59287/101 (Luke)								93.1	103.1	2	98.1	133
14565	Nord Desprez/2*Sel. 101								88.8	111.9	2	100.4	136
OR 6857	27-15//Rio/Rex/3/EA/4/Moro								74.7	93.3	2	84.0	114
Or 6882	Omar Mutant/3/178383/2*Omer//101								67.4	74.3	2	70.9	96
WA 5572	Omar Mutant 642026-197								64.9	63.0	2	64.0	87

-8-